

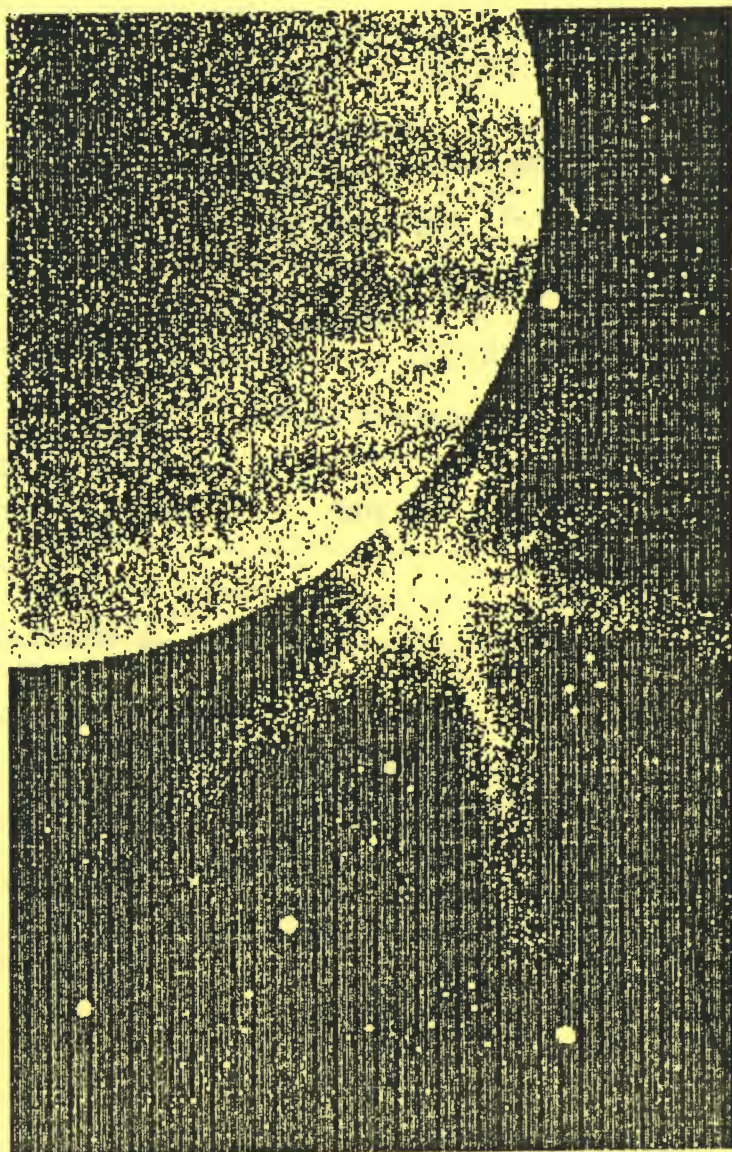
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STATUS

N E W S L E T T E R

VOLUME 5 · ISSUE 2

FEBRUARY · 1986



Assy Lang
Surge Prot
Switch for 288K mod

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EDITOR'S FILE

Sometimes, when you sit down at the keyboard in this job it just gets tough to think of something to write... I mean, after working on the articles that go into the issue and the copies of all the other clubs newsletters it just seems like, it's all been said.

So if I seem to ramble a little this issue, bear with me, it might just be computer shell shock.

Going over this months submissions it occurred to me that this club has taken a hard turn towards the do-it-yourself high technology end of the computer pool. Now, while I don't want to discourage all you "technos" out there (I don't discourage ANY ONE who writes!), I would like to see us balance out with some reviews or flights of whimsy once in awhile...

If I seem to ramble...
bear with me, it might just be
computer shell shock...

With club elections just around the corner, I'm getting a bad feeling about this (as Han Solo is want to say), because either you people don't realize that I'm on the nomination committee or my personal hygiene is getting lax...

I haven't heard from one person with a nomination.

It seems that the old apathy dragon has reared its ugly head again, and it just amazes me that people who get so worked up in how

their elected officials run things have so little interest in who gets elected...

On a lighter note, I'd like to take up a few lines to extend a great big thanks to Doug Boynton: the most consistent columnist I've had the pleasure to print, and also one of the best in the ATARI newsletter biz! His Telecomputing column has been refreshing and informative for almost as long as I've been keeping track of these things...

Plenty of excitement this month with a return engagement by Jim Parks concerning surge protection, Dick Litchfield's construction notes for yet another modification to the RAM modification and the continuing saga of the mysteries of assembly language by Chris Crawford.

If you don't like it, do something about it.

ERIII

TELECOMPUTING

By Doug Boynton

Bits and pieces this month...

New users of an IBM terminal package from Microsoft got a surprise lately. Seems that while they were using the program normally, they got a message on the screen that read, "Internal Security Violation... Trashing Program Disk."

It was, according to Online Magazine, part of a plan to discourage pirating of software. The message was supposed to show up on pirated copies. The disks weren't actually trashed and Microsoft removed the "bug" from later releases of the program.

Sometimes people who are shy and withdrawn in person are quite open and outgoing while behind the keyboard..

I've spoken (written) before about the psychology of telecomputing. Sometimes people who are shy and withdrawn in person are quite open and outgoing while behind the keyboard. That's nice. It's great that this medium has the capability of bring out the best in people, but here's another side to consider. In my business, broadcasting, many people "feel" as if they get to know on-air folks through their on-air personalities, even though they've never met the people behind the microphone. I converse often with people I've never met face-to-face...through the magic of the little box with the flashing LEDs.

The point is this -- why not put on your best possible face when you're conversing over the humming wires? Why not use your best Judith Martin manners, your best high school english, and (dare I say it?) your best spelling? It's the only shot many people have to get an impression of you. They can't see what a lovable lug you are in person. All they've got to go by is what they see that you've written.

So much for home-spun philosophy this month.

-ooo-

Funny story: A month or so ago, I got a call from a lady at the phone company in Elizabeth City, NC. She was trying to track down long-distance phone calls a youngster had made to the STATUS BBS. It seems he had convinced his parents that if someone stole his password and called the BBS using it, the charges would be put on their bill. It may work that way (sort of) on Compuserve, but it doesn't work that way on the old BBS. I tracked down several calls the kid made to the BBS...including the one where he applied for a password and entered his phone number. It matched dates and times of the disputed charges on the suspected phone number in North Carolina. There's probably a youngster in Elizabeth City that's still having a problem sitting down.

-ooo-

Not too long ago, 300 baud was the standard for most data transmission. As business had the need for quicker communications, 1200

baud became the business standard, and the prices of 300 baud modems fell into the consumer price-range. The same thing is happening to 1200 baud modems...as business moves to 2400 baud. 1200 baud Hayes-compatible modems are now selling for under \$150 in some places. Compuserve has started 2400 baud service in nine key cities around the country. I stick by a prediction I made on the BBS around the holidays...1200 baud modems will be under \$100 by year's end.

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STATUS BBS Tips: You can abort any menu and go the command line by hitting a Control-C while the menu is displaying. This would be especially useful for the Download File Menu...Or the Databank Menu.

If you're a new user entering a message, don't forget that you end it by hitting a slash, followed by the letter "S" (Example: /S). A slash-A aborts the message, and a slash-? gives you a listing of other commands for editing or listing your message. It's one of the toughest things to get the hang of for new users. If I can digress for a moment, the origins of the editing system go back to the old IBM text editors. Guess that says something about the roots of Matthew Singer, the fella that wrote the FoReM BBS program.

-ooo-

STUFF: Tom Dekker was having problems operating the "North End BBS" (491-1437) at 1200 baud. He's waiting for program modifications from Matthew Singer before going back to high-speed mode on his FoReM XL program.

Donny King's "1030 Killer" (481-1237) is in the "off" phase of its on-again, off-again operation.

The last message I saw said it was down TPN.

Don Pemberton's "007 BBS" (397-1007) has been going through more than its usual share of changes this month. Look for some kind of "modem club" when it all settles out, according to Don. He describes it as, "The club you don't have to go to meetings to...to join." [What! And miss the

joy of setting up Bylaws? Ed.] The latest version of his program [he's back to AMIS] is password free. Don's also gone to a Percom controller card, with DS/DD drives, and claiming 3 meg of storage will be available.

And from the gossipy hinterlands comes news that the Chocolate Connection [587-6255] is back up; beta-testing a new version of the program. Those who enjoy what Pati (spousal unit) calls, "fascinating repartee" will enjoy this C-64 BBS for the message base alone.

-000-

That's it for this month.
Keep 'em flying.

NEXT TIME: THE "PERFECT" BBS

SURGE PROTECTION

By Jim Parks

Line surges are devious little creatures that make themselves known to us in a variety of ways, from the subtle "missing bit" on a data disk to a pile of smoldering carbon on your desk. Surges and spikes in the power lines are a fact of life and, unless you wire your computer to a battery, you must accept the fact that sooner or later a spike will "get you".

Surges and spikes occur in the power lines daily and for all practical purposes cannot be stopped. Their effect, however, can be minimized by several methods. People often tell me that they always unplug their computer, or switch off the power strip after each use. This is an excellent habit to form and will certainly protect your equipment while you

are away. In fact, unplugging is the only way to be positively certain no "spikes" will ruin your system. This method of protection, unfortunately, does little to prevent surges while the system is operating.

Surges and spikes occur in the power lines daily and for all practical purposes cannot be stopped.

Luckily there are several devices available that will help minimize the effects of line spikes, but before we talk about hardware, let's examine a few facts about surges.

What are surges? Line surges and spikes are sudden increases in the voltage that is supplied by the power company. The line voltage is nominally 117 VAC throughout the U.S. and, generally speaking, most power companies do an excellent job of maintaining that voltage. In spite of the power company's strict monitoring, surges do occur on a daily basis.

What causes line surges? well, the most talked about source is lightning: lightning is attracted to tall objects, and utility poles are prime targets for lightning to vent its rage. More often though, line surges are less dynamic than an act of God. Power companies often switch large capacitor banks on and off during routine maintenance. The sudden charge and discharge of these capacitor banks can affect a whole city, and delicate computer equipment is very susceptible to this.

Common household appliances such as refrigerators and air conditioners can also generate spikes large enough to send "glitches" to your equipment. In fact almost any electric motor (hair dryers, blenders, etc.) will generate a voltage while it is running. Most often, these "back" voltages are negligible and harmless, but under the right conditions they could affect data in your computer.

Citizens band radios (or amateur radios) can be another source of spikes. Most microprocessors run at 1 to 4 megahertz, at or near a sub-harmonic frequency of these transmitters. As a result, the power cord from your computer to the wall outlet can make an excellent antenna to receive these "extra data" signals.

Some of the best hardware to prevent line surges is already built into your computer. today's computer power supply contains a "state-of-the-art" integrated circuit that monitors the voltage and adjusts accordingly. Small surges and spikes are dealt with here, and only larger spikes that exceed the IC's limits are passed on to the computer.

for those larger spikes, an inexpensive "surge protector strip" is an effective way to help your power supply keep the "garbage" out of your computer. Most of these strips have metal oxide varistors (MOVs) installed in them that limit the applied voltage to 125 VAC maximum. A larger voltage or spike is shunted to ground before it can damage your equipment. MOVs are usually rated at 30 to 70 amps and can safely shunt the

rated amount one time before becoming useless.

For those of you with a "CB" neighbor or who are experiencing "kitchen blender syndrome" an EMI/RFI filter will help reduce unwanted interference from these sources. An EMI/RFI filter is an electronic circuit that "passes" low frequency line voltage and "traps" the unwanted higher frequencies that may be passed on to your computer.

These devices are readily available at most computer stores, but basically, the best way to protect your gear is a combination of common sense and good luck. I have all my equipment plugged into a surge protection strip which is, in turn, unplugged whenever I leave my computer: an ounce of prevention as they say...

ASSEMBLY LANGUAGE

By Chris Crawford

Lesson Six

Subroutines & The Stack

We now take up the first topic in this series that is not absolutely essential to writing programs: subroutines. The loops and indexed addressing discussed in the previous lesson are truly essential: it is hardly possible to write a useful program that has no loops. Subroutines are a matter of convenience, not necessity. It is quite possible to write an entirely adequate program without using a single subroutine. However, you will find that the convenience of

subroutines with large programs is so great that you would never want to write such a program without them.

The use of subroutines
dramatically reduces the size
of a program..

The primary purpose of a subroutine is to perform some function that is frequently needed at many points in the program. Instead of having to repetitively insert the same code over and over again, we simply write it once, place it in a subroutine, and call that subroutine many times from the main program. The use of subroutines dramatically reduces the size of a program. Subroutines are implemented on the 6502 in a fashion very similar to that used in BASIC. You may recall the two BASIC commands for subroutines: "GOSUB line#" and "RETURN". The two corresponding 6502 commands are "JSR label" and "RTS". The label in the JSR command is the beginning of the subroutine. Thus, writing and using subroutines in 6502 is trivially simple. First, you write the subroutine. You give it a name (say "MYSUBR") and stick that label in front of the first instruction.

You put an RTS command after the last normal command of the subroutine. To call the subroutine you just put JSR MYSUBR.

That's all it takes.

However, in order to understand how it works is not so easy. Here's the problem we must solve when the 6502 jumps to a subroutine, the JSR instruction tells it

the destination address to which the 6502 must jump. But when the 6502 hits the RTS instruction, how does it know the address to which it must return? The RTS doesn't say, "Return to THIS address"; it says only "Return". Moreover, how could the 6502 know to return? If the subroutine can be called from, say five different points in the program, how would the 6502 know which of those points to which it must return?

What if we gave the 6502 a special register for remembering return addresses? That is, whenever the 6502 encounters a JSR instruction, it stores the current address into its return address register. Then when it encounters a RTS instruction, it simply takes the address out of the return address register. There is only one problem with this: What if we use nested subroutines (one subroutine calls another)? The second subroutine call will erase the return address for the first subroutine call.

Trouble! The solution to all this is called a stack. A stack is a chunk of RAM allocated for certain special operations such as subroutines. The 6502 stack is stored on page one -- That is, address \$0100 to \$01ff. The stack operates like 128 return address registers arranged in sequence (remember: two bytes per address).

the 6502 keeps a stack pointer register to keep track of which byte in the stack is currently being used. I will now trace through the operation of the stack in a subroutine.

We start with the stack pointer set equal to \$FF. That

means that the stack is empty; the stack pointer is at the very top of the stack. The 6502 encounters a JSR instruction. It takes the current value of the program counter and breaks it into two bytes. It pushes the first byte onto the stack. This means that it stores the first byte at \$01FF, then decrements the stack pointer.

Now the stack pointer is \$FE. Then the 6502 pushes the second byte of the return address onto the stack, storing that byte at \$01FE and decrementing the stack pointer to \$FD. Then the 6502 jumps to the subroutine. When it encounters the RTS instruction, it pulls the two address byte off of the stack (increments the stack pointers and loads byte address \$0100,SP) those two bytes go directly into the program counter, returning the 6502 to the original entry point.

The advantage of this approach is that it allows very deep nesting of subroutines. If one subroutine calls another, the 6502 simply stores more values onto the stack.

The addresses won't be confused because you always exit subroutines in exactly the reverse order that you entered them. You can use the stack yourself, if you wish.

You have six instructions that allow you to play with the stack: PHA, PLA, PHP, PLP, TSX and TXS. The PHA instruction pushes the value of the accumulator onto the stack and decrements the stack pointer. The PLA instruction increments the stack pointer and pulls the current stack value into the accumulator. These two instructions allow you to store and retrieve values onto the stack. They must be exactly balanced

though, or you will generate the most feared of bugs, the "stack crash".

Consider: you are in a subroutine. You push a value onto the stack, but forget to pull it off. When the 6502 attempts to return to its original location, it pulls two addresses off the byte stack -- but they're the wrong two bytes. One of them is the value you pushed but didn't pull. Result: the 6502 returns to the wrong address> Your program goes haywire and the computer crashes.

This is called a stack crash.

This type of crash tends to be particularly difficult to recover from. Prevention is the best medicine here. The rule for preventing stack crashes is simple and absolute: each and every push onto the stack must be balanced by one pull from the stack. Violate this rule and you will certainly experience a stack crash.

The next pair of stack manipulation instructions are PHP and PLP. These push and pull the process status register onto the stack. They are useful for two purposes. First, you may use them to save the values of the various flags before performing some operation, then restore them so that you can branch on a previously created condition. Second, it is sometimes handy to PHP, then PLA to get the processor status register into the accumulator where you can more directly manipulate it. Again, each push must be balanced with one pull.

The third stack manipulation pair of commands do not modify the stack. They are TSX and TXS.

These transfer the stack pointer to and from the x-register. Once in the x-register, you can change the value of the stack value and then TXS to jump over sections of the stack. This can be a very handy way to pass parameters to subroutines, but it can also be very tricky. If you make a mistake, you will generate a stack crash...so be careful with this one. I have always avoided these commands like the plague. They are very dangerous and never essential.

Switch Mod for Atari 288K

By Dick Litchfield

A number of us proud owners of 288k Atari 800s have run into a few problems with some programs. A few programs won't boot, a few others lock-up, and some have graphics problems. Well, say some, it's a trade off. But is it? Can't we have both worlds? YES, we can! After looking at the modification schematics, I came up with a very simple modification that does the trick for me. It may even be over simplistic.

Can't we have the best of both worlds? Yes we can! It may even be... over simplistic.

In the construction article you may remember inserting the 256K chips into the IC sockets and then putting the board back in the computer for a progress check of your work. If every thing was OK, your card functioned as a 16K card. At this time, you still had not cut the wide runs on

the right side of the memory board. These two runs were providing +5v to address lines A7 and A8 (pins 9 and 1 respectively of the 256k chip). With these lines held high by the +5v, we would never be able to use the additional memory. That is the reason for cutting the wide runs and removing the +5v from address lines A7 and A8.

Now to the modification...I merely placed a DPDT switch in the circuit between the SN74LS158 (mounted on Z503) and the 256K memory chips. I hold the address lines high(+5v) when I want the 48K mode. With the switch in one position, I have a 48K machine and in the other position I have the 288K machine.

I used a DPDT micro miniature toggle switch (Radio Shack p/n 275-626) and the same type of wire I used to install the 256K modification. Solder short wires (3") to the switch terminals, then squeeze the switch into the space between Z506 and Z507. The Radio Shack switch fits nicely between memory sockets for Z506 and Z507. Position the switch so the handle sticks just slightly above the top of the board. Be sure to install the switch with the metal sides toward the IC sockets. Do NOT GLUE the switch in place yet!! Make all the connections as shown in the drawings. Be sure to keep the wires as SHORT as possible.

After you have made all connections, set the switch in the position that enables the 256K and insert the memory board in the computer. Try loading your favorite ramdisk DOS and see if you can still access your ramdisk(s). If all is OK then shut you computer

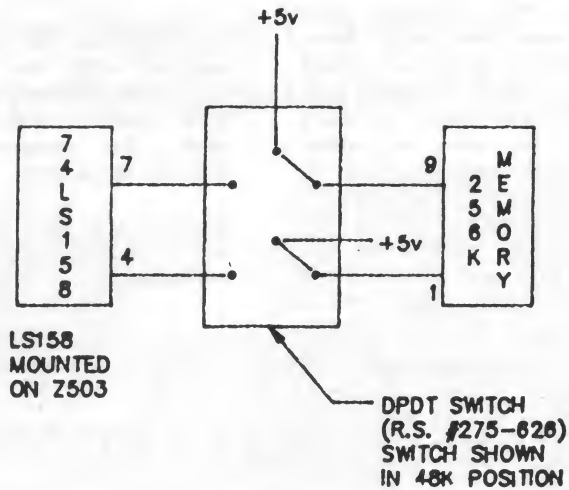


Fig. 1 WIRING DIAGRAM

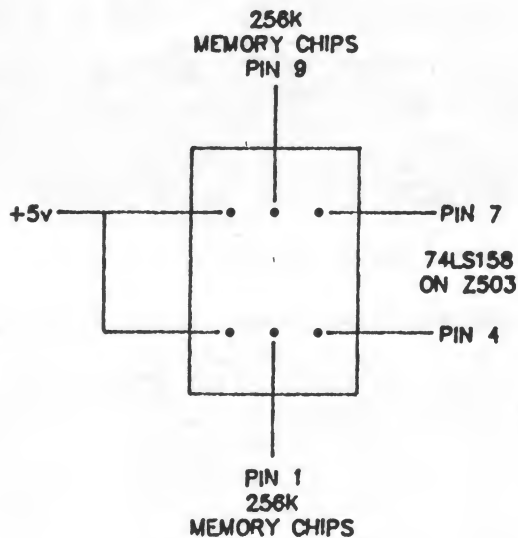


Fig 2 SWITCH CONNECTIONS (BOTTOM VIEW)

off, flip the new switch, power up again and see if you have the old 48K machine back. Should your machine not work as stated above, remove the memory board and check your work. If all is OK then you may superglue the switch in place if desired. Be sure to allow clearance for the computer cover to be installed.

A convenient point to pick up the +5v is the left end of one of the capacitors below the memory

chips as you look at the chip side of the memory board.

CAUTION: Do NOT change the switch position with the POWER ON. If you have eliminated your cartridge door switch, then make sure to shut the computer off before flipping the switch.

Well, that's it! Nothing elaborate and it works [for me]! Happy soldering!



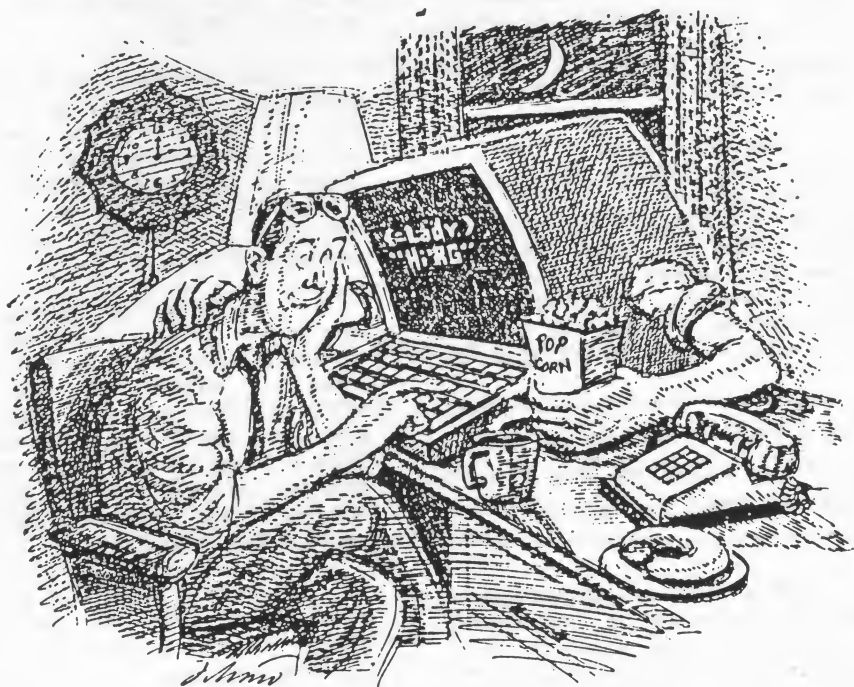
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PRESIDENT'S COLUMN

The ATARI evolution continues, the 1040ST with one Meg RAM, TOS in ROM, a built in double-sided 720K disk drive with built in power supply and with composite/RF output. It will make it's debut this month...gee it only seems like yesterday that we were all excited about the 520!

And speaking of the 520ST, it will be sold through retail stores in individual pieces. I have seen an ad in Popular Science, (mail order) selling the 520ST CPU and mouse for \$299.00, the disk drive goes for \$199.00. The 20Meg hard drive will be available for the STs soon with a price tag of \$799.00...

The ATARI evolution continues:
the 1040ST with one Meg of
RAM will debut this month...

And now for the close to home stuff...We selected a nominating committee for our upcoming elections in March, and they are: Betty Larkin, Buck Maddrey, Skip Poole, Gene Rodriguez III and John Whitehead, so if you wish to make a nomination please contact these folks and stay tuned for their announcement of the slate of candidates at the March Business meeting.

And some news on the "other" computer...The folks at Commodore are in a pinch financially, trying to make ends meet, and there is talk that the AMIGA will be reduced in price to make it more competitive, also that the company is

going to offer colleges a onetime good deal: AMIGAs at a 20% discount to their students. [Commodore reported losses in the 50-60 million dollar range for the last quarter of 1985 Ed.]

From the "Here We Go Again" department: ATARI plans to sell more of the 2600 game machines (\$49.00), and re-introduce the 7800 "super" game machine (\$79.00) with outstanding graphics, etc... Look for the introduction of new cartridges to follow.

And from the "That's Big" department: Texas instruments has announced that they have in the wings a 1 million byte chip, and AT&T has announced that they too will be selling these megabyte chips...a first for the "phone" company. We will just have to wait and see if our RAM Mod SIG gets a hold of this technology...

The STATUS RAM Mod SIG has introduced a one pass disk copy utility, which is available from our BBS, for those of you who have increased the memory in your 800, 800XL or 130XE. If you are interested in joining this SIG (Special Interest Group) contact J.C. Petty or Dick Litchfield.

HEY...Rick Rowland! In your review of the Voice Master, you stated that RAMTalker was from the MACE group...WRONG! It was STATUS in the January 1985 issue by Randy Holmes, Thank you.

I will close for now and since I haven't said it for quite some time now...Keep on Hacking.

S.T.A.T.U.S.

Opinions expressed in this publication are those of the individual authors and do not necessarily express or reflect the opinions of the Southside Tidewater Atari Technical Users Society. Some of the material contained herein may have been taken from bulletin boards and newsletters of other groups and should not necessarily be construed as fact.

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NEWSLETTER ARTICLES:

Submitted articles are preferred on disk text files, but will be gratefully accepted on hard copy (including handwriting) if you do not have a disc drive. If you have a modem, you can upload your articles to the Editor by calling 499-6021. Articles may be submitted anytime, but will probably not make that month's newsletter if submitted less than one week before the regular meeting date.

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